

The steam is admitted to the turbine through a governor valve. Both this valve and the overload by-pass valve are automatic, and are controlled from the governor through steam relays.

The relay for the governor valve has a small plunger valve as its exhaust valve in the relay cylinder. This plunger valve has an oscillating motion given to it from the spindle actuating the oil-pump, and is also directly controlled by the governor. Steam is constantly admitted to the relay cylinder. When the exhaust valve is shut, the steam pressure lifts the governor valve against the force of a spring. When the relay governor exhausts, this spring closes the governor valve. As the motion of the relay exhaust valve is oscillatory the main valve also alternately opens and closes, and hence the steam is admitted in gusts. These gusts become of longer and longer duration until at the overload capacity the admission is nearly continuous.

One of the most important improvements made in the detail of the Parsons machine is what is known as the end-tightened blading.

For many years Parsons turbines were made with small radial clearances between the tips of the blades and the surfaces of the cylinder and shaft. These fine clearances, which were necessary to prevent leakage of the steam over the blade tips, constituted the principal weakness of machines of the Parsons type.

The tip leakage was most serious at the high-pressure end of the machine, as the clearances there bore an appreciable relation to the length of the blades, which were here short. Moreover, it was just at this point where the higher temperature of the steam rendered it unwise to run the clearances too fine. Thus these radial clearances could not be reduced without endangering safety of operation, nor increased without lowering steam economy.

This disability has been minimized by the development of the present Parsons " end-tightened " blading. This has now been in commercial use about ten years, and is therefore established as regards reliability. This system of blading entirely eliminates fine radial clearances, appears to suffer very little deterioration with service, and gives mechanical reliability.

In fig. 12 a perspective view of end-tightened reaction pairs of rows (one fixed and one moving) forming a part of the blading of a Parsons machine is shown. It will be noted that whereas in the case of the original radial-clearance blading the spacing pieces at the roots of the blades are finished flush with the surface of the turbine cylinder and shaft, in the case of the end-tightened blading they project above and form a continuous barrier BB (see fig. 15).

The shrouding strip round the outer circumference of the blade rings projects over the edge of the blades on one side in such a manner that in each pair of rows the shrouding strip of one row projects against the barrier formed by the spacing strip of the other.

The space between the projecting shrouding strip and the corresponding barrier forms the working clearance which prevents the steam passing freely from one row of blades to the next.

It will be noted that this clearance is axial, and it can be adjusted at will